

stomach. Once a bear had eaten a large piece of greasy canvas which had been thrown away and had been blown some 200 or 300 yards from the house. He then came up to the house and commenced to eat our blubber, but was immediately shot. On February 20 a bear was seen about 350 feet above the hill at the back of the house. Some hands went up with a rifle and found that the bear had a hole there, out of which they could not get it—fortunately for them, as they had only one rifle with them, and that would not go off, the lock having been frozen. We never saw any young bear with it. The last time the bear was seen at its hole was on March 1. No track of a bear could be traced up the hill, but the foot-marks of an old bear and a cub were seen on the low land, about 300 yards to the eastward of the house. No old she-bears with young cubs were seen before we left the land in June. In July, 1881, on nearing Cape Crowther, walrus were seen lying on loose pieces of ice in great numbers. Sometimes twenty or more were counted huddled up in a heap on a small piece of ice. By going quietly in a boat you could get within twenty or thirty yards of them before they took much notice of you, but after the first shot was fired they tumbled into the water, and would go swimming about and barking round the boat, but never attacked us. In September they were very numerous on the loose ice round Bell Island, and also in the water off Cape Flora. On October 28 five were shot lying on the ice edge. When the daylight returned in February, walrus were constantly seen swimming about in the water. A land floe began to form in March, and no water remained within seven or eight miles of the land, but frequently on looking with the glass from the hill, walrus could be seen in the water, and on June 13 the land ice broke away, and on June 15 the five walrus were shot. A boat that went over to Bell Island reported that walrus were lying in scores on the loose ice round about Bell Island. Mr. Leigh Smith thinks that the walrus leave the country during the winter, but seem to remain in the water, especially if it is shallow. They never saw any signs of their taking the land and lying up for the winter. White whales and narwhal were seen in great numbers in September and October travelling to the south-east, and in June one or two large shoals were seen travelling west and west-north-west."

PROFESSOR HAECKEL IN CEYLON¹ IV.

PROF. HAECKEL, in describing his first impression of Galle, does not fail to mention as one of its principal features the long lines of shady Suriya trees and flowering Hibiscus, planted by the Dutch, and giving the streets the appearance of a garden. He says nothing, however, of a plague produced by the Suriya, and noted by other travellers, namely, the hairy green caterpillar, which frequents it in great numbers. At a certain stage of its growth it drops to the ground, and there hides in order to pass through its metamorphosis. When, as often happens, it alights on some passer-by, it inflicts a sting more severe and far more lasting than that of a nettle or star-fish.

The professor found himself, as might have been expected, a welcome guest to all the cultivated and wealthy merchants of Galle. The few days of his stay there were passed at Queens-House, formerly the official residence of the Governor, now the property of Messrs. Clark, Spence and Co., by whose present head, Mr. Henry Scott, Prof. Haeckel was hospitably entertained, every facility being afforded him for the prosecution of his studies. Among the English residents to whom Prof. Haeckel brought letters, and who vied with each other in making his visit to Galle both profitable and agreeable, he makes special mention of Capt. Blyth and Capt. Bayley.

¹ Continued from page 377.

The Villa Marina of the latter gentleman is one of the most charming spots in the neighbourhood of Galle. Built upon a rock jutting far out into the sea, but thickly grown with screw pines, it commands a lovely view of the town and harbour, with a picturesque foreground of rugged black rocks, which serve to enhance the beauty of the fairy-like tropical garden immediately surrounding the Villa.

"Among the many charms of this garden I was particularly interested to find several beautiful examples of the Egyptian Dhum-palm (*Hyphane thebaica*). The stem of this palm does not, like others of the same family, consist of a slender column, but has forked branches, like the Dragon trees, or *Dracaenæ*; each limb carries a crown of feather-shaded leaves. I had first seen this remarkable palm in the Arabian village of Tur, at the foot of Mount Sinai, and I gave a description of it in my work on 'Arabian Corals.' Great, therefore, was my surprise at finding it here in so altered a dress that I should scarcely have recognised it. The process of adaptation to its altered conditions of existence had completely transformed the tree. The stem was at least twice as large and strong as that of the Egyptian Dhum Palm; the forked branches were more numerous, shorter, and closer together; the huge, feathery leaves were much larger, more luxuriant, and thicker, and the flowers and fruit appeared, as far as my memory served, to have gained in size and beauty.

"In fact every part of the tree had been so modified by the forcing climate of Ceylon that its inherited characteristics seemed in great measure to have disappeared. This magnificent tree had been sown from Egyptian seed, and in twenty years had reached a height of thirty feet. . . .

"Capt. Bayley's charming villa, the Miramare of Galle, is as interesting to the zoologist as to the botanical student. A miniature menagerie constructed in the court-yard contains many curious mammalia and birds, as for example, an ostrich from New Holland, several owls and parrots, and a native ant-eater (*Manis*). This last, together with some curious fish, Capt. Bayley was so kind as to present to me; and later on, at Belligemma, he sent me a Christmas present of a pair of interesting Loris (*Stenops*).

"But more attractive to me than even these curious animals was the splendid coral which covered the surrounding rocks; even the little harbour in which the Captain moored his boat and the stone jetty which formed the landing-place were profusely covered with it, and a few hours sufficed to secure valuable additions to my collection of corals. A large proportion of the animal life inhabiting the extensive coral banks of Galle is here to be found, as it were, epitomised; gigantic black sea-urchins and red star-fish, numerous crabs and fishes, bright-coloured snails and mussels, and curious marine reptiles of many kinds swarmed on the coral branches and crept from between their crevices. No better or more convenient spot could be found for the establishment of a zoological station than Captain Bayley's villa, which, as it so happens, his approaching removal to Colombo renders him willing to dispose of."

Once landed on a coral reef, Prof. Haeckel finds himself at the goal of his desires, and his account of the submarine coral banks which to a great extent block the entrance to the harbour of Galle is too interesting not to be given at length. He regrets at the outset that he could only devote days instead of weeks to their examination. "In this respect, the Viennese artist, Ransonnnet, was more fortunate. Possessed of every necessary appliance, including a diving-bell, he was able to devote several weeks to the inspection of the coral banks of Galle, and has given a minute description of them in his illustrated work on Ceylon (Braunschweig, Westermann, 1868). Four coloured plates, for which he made the

sketches under water in his diving-bell, give a striking representation of the coral insect "in his habit as he lives." For my own part, it is nine years since, in the spring of 1873 I visited the coral banks of Tur at the foot of Sinai, and there first became acquainted with the wonderful manifestations of life in this submarine fairy land. My interest was roused to the highest pitch, and I endeavoured, in my popular treatise on "Arabian Corals" (Berlin, 1876), briefly to describe the organisation of these curious animals and their mode of life in common with that of various other creatures. The corals of Ceylon as I studied them at Galle, and afterwards in more detail at Belligemma, recalled pleasant memories and enriched my mind with a store of fresh observations."

"The marine fauna of Ceylon is indeed closely related to that of the Arabian shore of the Red Sea, the two having many genera and species in common. But in number and variety of forms of life, the extensive bay of the Indian Ocean with its varied coast formation is far richer than the confined Arabian Gulf where the conditions of life are simpler and more uniform, and I found considerable variations underlying the apparently similar physiognomy of the coral banks in the two districts. Those of Tur were chiefly characterised by warm tones, such as yellow, orange, or red, while the coral groves of Ceylon displayed little but green in every variety of shade. Yellow green *Alcyonaria* alternated with sea-green *Heteropora*, malachite green *Anthophylla* with olive-green *Millepora*, emerald green *Madrapora* and *Astræa* with brown-green *Montipora* and *Mæandrina*. Ransonnet has justly remarked on the predominance of green throughout the island of Ceylon. Not only is this 'ever-green isle' decked the whole year through with verdure that never fades, but even the animals that inhabit it are for the most part green in colour. The most frequently occurring birds and lizards, butterflies and beetles, are of a brilliant green hue; so also are many of the fishes and crabs, *Amphinomæ* and *Actinia*; even animals which elsewhere are seldom or never green, here don the prevailing livery; such are star-fish (*Ophiurida*), sea-urchins, sea-cucumbers, giant-mussels (*Tridacna*), and many others. The explanation of this remarkable phenomenon must be sought for in the Darwinian theory of development, especially in the law of adaptation as applied to the 'sympathetic selection of colour,' which I have demonstrated in my 'Natural History of Creation' (seventh edition, p. 235). The less the colour of an animal differs from that of its surroundings, the less likely it is to attract the attention of its enemies; it is better able also to approach its prey unobserved, and its chances in the struggle for existence are thereby indefinitely increased."

"Natural selection will strengthen the resemblance in colour between animals and their surroundings, as being of advantage to the former. The coral banks of Ceylon, with their inhabitants, afford as good an illustration of this theory as the animals dwelling in the woods and thickets of the island, and in purity and brilliancy of colour the former have a distinct advantage. It would be a great mistake to imagine that an effect of monotony resulted from this tendency to uniformity of colour. On the contrary, the eye is never tired of admiring the manifold combinations and modifications which occur, and which are heightened by the not infrequent juxtaposition of other colours. Just as the brilliant hues, red, yellow, or blue of many of the birds and insects of Ceylon heighten the effect of the dark green foliage, so the coral banks gain in beauty from contrast with the many-coloured marine animals which frequent them. Such are delicately variegated little crabs and fishes which seek their food among the coral branches. Many of the corals themselves are of gay and pleasing colours, e.g. rose-red *Protilloporæ*, red or yellow star coral, violet and brown *Heteropora*, and *Madrepora*, &c. Unfortunately, these lovely colours are for the most part very fugitive,

and disappear after a short exposure to the air. The cilia and bright tentacula of the sensitive polypi are withdrawn and concealed the instant the coral is disturbed, and the whole becomes dull and colourless."

"The eye which has been charmed by the brilliant hues of the coral grove and its inhabitants is held spell-bound by the beauty and variety of form revealed by these animals. Each individual coral may well be compared to a flower and each group of coral branches to a plant, a tree, or a bush. Indeed, the belief that coral was a vegetable growth was formerly universal, and it was long before the idea of its animal origin gained general acceptance. An entrancing and truly fairy-like view of these marvellous coral banks may be had from a boat during ebb tide, when the sea is calm. In the immediate neighbourhood of the fort of Galle the water is crystal clear, and so shallow that the keel of the boat sometimes grates against the coral, and the outlines of the branches can be distinguished even from the walls of the fort above. A great variety of the most beautiful and remarkable polypi are here comprised within a very small space, and before many days were over I had amassed a large collection."

"Mr. Scott's garden, which he had kindly placed at my disposal for drying purposes, presented a very remarkable appearance during the days of my stay at Queen's House. The lovely tropical plants seemed to be competing for the prize of beauty with the strange marine creatures which had usurped their domain, and the delighted naturalist wandered up and down feasting his eyes now on the one and now on the other, uncertain as to which should carry off the palm. It was impossible not to be struck by the similarity in form between the polypi and many of the garden plants; and the orchids and spice lilies were, in their turn, hardly distinguishable from insects. It was as though the two great kingdoms of the organic world intimated their desire to change places."

"The majority of the coral which I collected in Galle and afterwards in Belligemma was obtained by divers. These I found quite as skilful and enduring as the Arabian divers I had employed nine years before at Tur. Armed with an iron stake they loosened large blocks of coral from their foundation, and raised them with great dexterity into the boat. Many of the blocks weighed from 50 to 80 pounds, and it cost no little trouble and care to deposit them safely. Some of the most beautiful varieties are so brittle, that they break with their own weight when taken out of the water, and cannot by any possibility be preserved entire."

"The full beauty of the coral banks cannot be seen from above, even though the water be so shallow that the points of coral scrape the keel of the boat. Not possessing a diving-bell, I learnt with a little practice to swim to the bottom with my eyes open, and most marvellous were then the effects of the mystic green light in which the submarine world was bathed, so different from the rosy light of the upper air. The forms and movements of the swarms of animals peopling the coral banks were doubly curious and interesting thus seen."

"A multitude of curious fishes, crabs, snails, mussels, star-fish, &c., feed on the coral insect, upon which they make their dwelling, and these coral eaters—which may be classed among parasites—have acquired the most abnormal forms and weapons of defence and aggression, in the course of their adaptation to their peculiar mode of life. But not without risk does the naturalist venture among the coral groves. The *Oceanidæ*, guardians of the treasures of the deep, warn off the rash intruder in a thousand ways. The fire-coral (*Millepora*) and the *Medusæ* swimming among them burn, when touched, like the worst of stinging nettles. and the floating stings of many *Synanceia* are as painful and dangerous as those of the scorpion. Then the nip of crabs, large and small, is a peril by no means to be despised. Black sea-urchins

(*Diadema*) bore their long barbed stings into the flesh of the foot, where they break off and remain, inflicting painful and dangerous wounds. But the worst of all injuries to the skin are inflicted by the coral rocks themselves. The myriads of hard points and edges with which they are armed inflict numberless wounds on the hands which attempt to uproot them."

"I never in my life had such a lacerated and smarting skin as after a few days diving and coral fishing at the Point de Galle. The wounds did not heal for several weeks. But what were such temporary sufferings as these in comparison with the wealth of new impressions and delights with which this visit to the wonderful coral-banks of Ceylon enriched my whole future life!"

THE BRITISH ASSOCIATION

THE fifty-second annual meeting of the British Association was opened yesterday at Southampton, when Sir John Lubbock resigned the presidency to Dr. C. W. Siemens, F.R.S., the president-elect. We have already given such full details concerning the arrangements, that at this stage little more remains to be said. All the provisions made by the local committee appear to be quite satisfactory, and although we cannot expect the attendance to be so large as at the Jubilee last year, still some eminent foreign men of science are expected—Helmholtz, Clausius, Du Bois Reymond, J. P. Cook, Langley, Von Rath, Baumhauer, and others.

INAUGURAL ADDRESS BY C. WILLIAM SIEMENS, D.C.L. (OXON), LL.D. (GLASG. AND DUBL.), PH.D., F.R.S., F.C.S., MEMBER INST. C.E., PRESIDENT

IN venturing to address the British Association from this chair, I feel that I have taken upon myself a task involving very serious responsibility. The Association has for half a century fulfilled the important mission of drawing together, once every year, scientists from all parts of the country for the purpose of discussing questions of mutual interest, and of cultivating those personal relations which aid so powerfully in harmonising views, and in stimulating concerted action for the advancement of science.

A sad event casts a shadow over our gathering. While still mourning the irreparable loss Science had sustained in the person of Charles Darwin, whose bold conceptions, patient labour, and genial mind made him almost a type of unsurpassed excellence, telegraphic news reached Cambridge just a month ago, to the effect that our Honorary Secretary, Professor F. M. Balfour, had lost his life during an attempted ascent of the Aiguille Blanche de Penteret. Although only thirty years of age, few men have won distinction so rapidly and so deservedly. After attending the lectures of Michael Foster, he completed his studies of Biology under Dr. Anton Dohrn at the Zoological Station of Naples in 1875. In 1878 he was elected a Fellow, and in November last a member of the Council of the Royal Society, when he was also awarded one of the Royal Medals for his embryological researches. Within a short interval of time Glasgow University conferred on him their honorary degree of LL.D., he was elected President of the Cambridge Philosophical Society, and after having declined very tempting offers from the Universities of Oxford and Edinburgh he accepted a professorship of Animal Morphology created for him by his own University. Few men could have borne without hurt such a stream of honourable distinctions, but in young Balfour genius and independence of thought were happily blended with industry and personal modesty; these won for him the friendship, esteem, and admiration of all who knew him.

Since the days of the first meeting of the Association in York in 1831, great changes have taken place in the means at our disposal for exchanging views, either personally or through the medium of type. The creation of the railway system has enabled congenial minds to attend frequent meetings of those special Societies, which have sprung into existence since the foundation of the British Association, amongst which I need only name here the Physical, Geographical, Meteorological, Anthropological, and Linnean, cultivating abstract science, and the Institution of Mechanical Engineers, the Institution of Naval

Architects, the Iron and Steel Institute, the Society of Telegraph Engineers and Electricians, the Gas Institute, the Sanitary Institute, and the Society of Chemical Industry, representing applied science. These meet at frequent intervals in London, whilst others, having similar objects in view, hold their meetings at the University towns, and at other centres of intelligence and industry throughout the country, giving evidence of great mental activity, and producing some of those very results which the founders of the British Association wished to see realised. If we consider further the extraordinary development of scientific journalism which has taken place, it cannot surprise us when we meet with expressions of opinion to the effect that the British Association has fulfilled its mission, and should now yield its place to those special Societies it has served to call into existence. On the other hand, it may be urged that the brilliant success of last year's Anniversary Meeting, enhanced by the comprehensive address delivered on that occasion by my distinguished predecessor in office, Sir John Lubbock, has proved, at least, that the British Association is not dead in the affection of its members, and it behoves us at this, the first ordinary gathering in the second half century, to consider what are the strong points to rely upon for the continuance of a career of success and usefulness.

If the facilities brought home to our doors of acquiring scientific information have increased, the necessities for scientific inquiry have increased in a greater ratio. The time was when science was cultivated only by the few, who looked upon its application to the arts and manufactures as almost beneath their consideration; this they were content to leave in the hands of others, who, with only commercial aims in view, did not aspire to further the objects of science for its own sake, but thought only of benefiting by its teachings. Progress could not be rapid under this condition of things, because the man of pure science rarely pursued his inquiry beyond the mere enunciation of a physical or chemical principle, whilst the simpler practitioner was at a loss how to harmonise the new knowledge with the stock of information which formed his mental capital in trade.

The advancement of the last fifty years has, I venture to submit, rendered theory and practice so interdependent, that an intimate union between them is a matter of absolute necessity for our future progress. Take, for instance, the art of dyeing, and we find that the discovery of new colouring matters derived from waste products, such as coal-tar, completely changes its practice, and renders an intimate knowledge of the science of chemistry a matter of absolute necessity to the practitioner. In telegraphy and in the new arts of applying electricity to lighting, to the transmission of power, and to metallurgical operations, problems arise at every turn, requiring for their solution not only an intimate acquaintance with, but a positive advance upon electrical science, as established by purely theoretical research in the laboratory. In general engineering the mere practical art of constructing a machine so designed and proportioned as to produce mechanically the desired effect, would suffice no longer. Our increased knowledge of the nature of the mutual relations between the different forms of energy makes us see clearly what are the theoretical limits of effect; these, although beyond our absolute reach, may be looked upon as the asymptotes to be approached indefinitely by the hyperbolic course of practical progress, of which we should never lose sight. Cases arise, moreover, where the introduction of new materials of construction, or the call for new effects, renders former rules wholly insufficient. In all these cases practical knowledge has to go hand in hand with advanced science in order to accomplish the desired end.

Far be it from me to think lightly of the ardent students of nature who, in their devotion to research, do not allow their minds to travel into the regions of utilitarianism and of self-interest. These, the high priests of science, command our utmost admiration; but it is not to them that we can look for our current progress in practical science, much less can we look for it to the "rule of thumb" practitioner, who is guided by what comes nearer to instinct than to reason. It is to the man of science, who also gives attention to practical questions, and to the practitioner, who devotes part of his time to the prosecution of strictly scientific investigations, that we owe the rapid progress of the present day, both merging more and more into one class, that of pioneers in the domain of nature. It is such men that Archimedes must have desired when he refused to teach his disciples the art of constructing his powerful ballistic engines, exhorting them to give their attention to the principles involved in their